CLAIMS

1. Integrated optics filtering component comprising in a substrate (10) at least one filtering unit (17) comprising an optical guide core (11), an optical cladding (13) independent of the core and at least two zones of interaction elementary in series (Z1, Z2, Z3, Z4), in which each elementary zone of interaction has at least one structural parameter that is different from that or those adjacent to it, each zone of interaction elementary being defined by a zone of the substrate comprising an elementary grating (R1, R2, R3, R4) for coupling between the guide core and the optical cladding, at least one portion of the cladding called the elementary cladding (G1,G2,G3) surrounding at least one portion of the core, called the elementary core, the refractive index of each elementary cladding being different from the refractive index of the substrate and lower than the refractive index of the core at least in the part of the elementary cladding next to the elementary core, the different elementary gratings of a filtering unit forming a grating.

2. Component of claim 1, characterised in that each elementary cladding has a refractive index higher than that of the substrate.

3. Component of any of claims 1 and 2, characterised in that the elementary grating of a zone of interaction is formed in the guide core and/or in the cladding and/or in the substrate.

4. Component of any of claims 1 to 3, characterised in that each elementary zone of interaction has at least one structural parameter different from that or those to which it is adjacent, in which each zone of interaction is differentiated from another zone of interaction by at least one characteristic selected from a coupling efficiency of the elementary grating corresponding to this zone, a central wave length for coupling of this elementary grating and/or a coupling phase of the elementary grating.

5. Component of any of claims 1 to 4, characterised in that for each zone of interaction, the structural parameters are selected from at least the following:

- the length L of the elementary grating,
- the period Λ of the elementary grating,
- the profile of the elementary grating,
- the position of the elementary grating in the zone of interaction,
- Δn the amplitude of the effective index modulation induced by the elementary grating,
- ϕ the phase of the elementary grating,
- the dimensions of the elementary cladding ,
- the dimensions of the elementary core,
- the value of the refractive index of the elementary cladding ,
- the value of the index of the elementary core,

- the position of the elementary cladding in the substrate,

- the position of the core elementary in the cladding.

6. Component of any of claims 1 to 5, characterised in that the grating has a profile that is constant in period and/or amplitude.

7. Component of claim 6, characterised in that each elementary cladding of a filtering unit has a section in a plane perpendicular to the direction of propagation of a light wave and/or is centred with respect to the corresponding elementary core of the zone of interaction, different from those of the other elementary claddings of the said unit.

8. Component of claim 6 or 7, characterised in that each elementary core of a filtering unit has a section in a plane that is perpendicular to the direction of propagation of a light wave and/or centred with respect to the elementary cladding of the corresponding zone of interaction, different to those of the other elementary cores of the said unit.

9. Component of any of claims 6 to 9, characterised in that the function defined by the elementary gratings of a filtering unit comprises phase changes.

10. Component of claim 9, characterised in that the phase changes are formed between each elementary grating by an offset corresponding to a change in value of the function phase created by the profile of the elementary grating.

11. Component of any of the previous claims, characterised in that the filtering unit of the invention comprises between two consecutive elementary claddings or between two consecutive groups of elementary claddings, a dissipating element for all or part of the cladding modes.

12. Component of claim 11, characterised in that this dissipating element is created by a reduction in section between two elementary claddings.

13. Component of claim 11, characterised in that this dissipating element is created by an intermediate cladding, positioned between two elementary claddings, the section of the intermediate cladding being smaller than at least one of the sections of the two elementary claddings.

14. Component of claim 11, characterised in that this dissipating element is created by a zone of the substrate positioned between two elementary claddings.

15. Component of any of the previous claims, characterised in that a sampling element is optically connected to the cladding of the filtering unit.

16. Component of any of the previous claims, characterised in that it comprises several filtering units.

17. Component of any of the previous claims, characterised in that the filtering unit creates a gain flattening filter.

18. Fabrication method of an integrated optics component comprising in a substrate at least one filtering unit (17) of any of the previous claims, characterised in that the core (11) and the cladding (13) of each filtering unit are respectively created by a modification of the refractive index of the substrate so that at least in the part of the cladding next to the core and at least in the zone of interaction, the refractive index of the cladding is different from the refractive index of the substrate and lower than the refractive index of the core and in that the grating is created by a modification of the effective index of the substrate.

19. Fabrication method of claim 18, characterised in that the modification of the refractive index of the substrate is obtained by radiation and/or by the introduction of ionic species

20. Fabrication method of claim 19, characterised in that it comprises the following steps:

- a) introduction of a first ionic species in the substrate so as to permit the optical cladding to be obtained after step c),

- b) introduction of a second ionic species in the substrate so as to permit the guide core to be obtained after step c),

- c) burying of the ions introduced in steps a) and b) so as to obtain the cladding and the guide core,

- d) formation of the grating.

21. Fabrication method of claim 20, characterised in that the first and/or the second ionic species are introduced by an ionic exchange or by ionic implantation.

22. Fabrication method of claim 20 or 21, characterised in that the substrate is made of glass and contains Na+ ions, the first and the second ionic species are Ag+ and/or K+ ions.

23. Fabrication method of any of claims 20 to 22, characterised in that step a) comprises the creation of a first mask (61) comprising a pattern capable of creating the cladding, in which the introduction of the first ionic species is carried out through this first mask and step b) comprises the elimination of the first mask and the creation of a second mask (65) comprising a pattern capable of creating the core, in which the introduction of the second ionic species is carried out through this second mask.

24. Fabrication method of any of claims 20 to 22, characterised in that step a) comprises the creation of a mask comprising a pattern capable of creating the cladding and the core, in which the introduction of the first and second ionic species is carried out though this mask.

25. Fabrication method of any of claims 18 to 24, characterised in that the grating is obtained by the introduction of ionic species though a mask permitting the core and/or the cladding to be created or by a specific mask.

26. Fabrication method of any of claims 18 to 24, characterised in that the grating is obtained by localised heating.

27. Fabrication method of any of claims 18 to 24, characterised in that the grating is obtained by etching of the substrate next to the zones of interaction.

28. Fabrication method of any of claims 20 to 27, characterised in that the first ionic species is buried at least partially before step b) and that the first and second ionic species are buried after step b).

29. Fabrication method of any of claims 20 to 28, characterised in that the first ionic species and the second ionic species are buried after step b).

30. Fabrication method of any of claims 20 to 29, characterised in that at least part of the burying is carried out with the application of an electrical field.

31. Fabrication method of any of claims 20 to 30, characterised in that at least part of the burying is carried out by re-diffusion in an ionic bath.

32. Fabrication method of any of claims 20 to 31, characterised in that all or part of the burying is carried out by depositing at least one layer on the surface of the substrate.

33. Fabrication method of any of claims 20 to 32, characterised in that the first ionic species and/or the second ionic species are introduced with the application of an electrical field.